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by Eugenie Clark

SCIENTIFIC INVESTIGATION IN MICRONESIA - PACIFIC SCIENCE BOARD

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This report covers the field activities of the writer from June 24 to August 14 concerned mostly with the collecting of reef fishes, particularly those of the Order Plectognathi. Transportation, living accommodations, and facilities for this work were made possible through the generous cooperation of the Navy, the Army, MATS, the Pacific War Memorial, a number of U. S. civil service employees, and natives of the islands visited.

Places and dates of collections.

The following list includes the islands visited and the dates when fish collections were made:

Kwajalein	June 24
Guam	June 28, 29, July 2, 3, 5, 7, 17
Saipan	June 9, 10, 11, 12, 13, 14
Koror	July 21, 23, 25, 26, 27, 29, 30, 31, August 11, 14
Angaur	August 3, 4, 5, 6, 7

Methods used in collecting.

The following methods used in making fish collections are discussed in the order of the frequency with which they have been employed:

(1) Poisoning. One gallon of emulsifiable 5% rotenone was supplied by S. B. Penick Co. This new preparation is being used for the first time to poison marine fishes and is highly effective; one ounce has been sufficient in a tide pool of approximately 240 cu. ft. of sea water. It has several advantages over the commonly used derris root powder, being much less bulky, easier to use, and quicker in dissolving and spreading. Freshly mashed derris roots have also been used. This plant is easy to obtain in the Palaus.

(2) Spear fishing. This is a particularly good method for collecting plectognath fishes, most of which are sluggish and easily trapped in crevices where they can be speared and pulled out, in some cases a crowbar is used to break away the soft coral. The natives employed for this are highly proficient and can usually obtain any specimen of Plectognathi pointed out to them. This method, in which underwater goggles are used, enables the writer to observe some of the habits and habitats of many of the reef fishes.

(3) Trap fishing. By making rounds of some of the native traps on Guam and Koror, a number of plectognaths have been secured and many types of larger reef fish have been examined.

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(4) Hand net fishing. This method used by some Palauan fishermen procures a small variety of fishes, mostly acanthurids and pomacentrids. Two elongated, shallow water, wire nets are set around a stone which is then lifted and the agitated fish are frequently caught in the nets.

(5) Hook and line fishing. Two specimens of Canthidermids were obtained from fishermen in Angaur who use hand lines outside the reefs at depths of over 6 fathoms. A number of pelagic fishes were examined in catches from trawling.

(6) Use of explosives. One collection of fishes was made by blasting with dynamite under the supervision of Major Richardson on Angaur.

#### Reef fishes in general.

The collections have been made mostly in shallow water from tide pools of less than one ft. deep to the outer borders of fringing reefs in waters up to about 36 ft. deep and include representatives of at least 34 families comprising over 300 species.

#### Plectognath fishes.

The pelagic molids, deep sea triacanthids, and the rare triodontid are not represented in the plectognath collections so far probably due to their rarity and/or the limitation of our collecting methods to inside the reefs. The balistids and tetraodontids, however, are among the most common reef fishes. Table 1. shows the number of specimens of each plectognath species collected.

#### PALAUAN PLECTOGNATH FISHES

Balistidae. The Palauan names for fishes of this family are as follows:

Tunk - general term for trigger fishes.

Nelenge lt - Canthidermis (new species?).

Ilamrokl - Balistapus undulatus.

Dukl euilt - Melichthys radula.

Dukl beab - Balistes viridescens.

The fishermen claim there are at least two other kinds of "tunks" not in my collection so far and they are referred to as "duk1 erak1" and "olikeltunk."

Monacanthidae. A small species, Monacanthus tomentosus, is called "cheialach" in Palauan and the larger monacanthids are referred to as "lung." The natives use the skin as sandpaper.

Ostraciidae. These fishes "riamel" (spineless species) and "karmasuus" (spiny form) are considered to be the most palatable of the plectognaths.

Canthigasteridae. Canthigaster margaritatus, the most common tide pool fish in the Mariannas, although on Abe's check list for the Palaus, has not yet been seen here by the writer. C. cinctus occurs around shallow reefs and two other unidentified species not recorded from the Palaus have been seen by the writer but not yet collected.

Tetraodontidae. These fishes as well as the canthigasterids are called "telebudel" by the Palauans. They are common in tide pools and open shallow reefs.

Diodontidae. Diodon hystrix is common in shallow reefy waters and is called "derudm" by the Palauans.

#### Poisonous fishes: Plectognathi.

A number of plectognath fishes, particularly the "puffers," are notorious for their poisonous properties. In the Palaus it is a popular belief that no poisonous fishes occur here. The fishermen report, however, that members of the three families of puffers have highly poisonous ovaries but that the flesh is always good to eat. They tell of one Palauan and several Japanese that have died from eating the eggs of a local Tetraodon. The skin of these fish, often reported as "poisonous" in the literature, is considered harmful by the natives because the prickles and spines sometimes catch in the throats of dogs and cats and cause them to choke, but the skin is not believed to have any toxic properties. The balistids, monacanthids, and ostraciids (reported to be poisonous in other parts of the world) are considered harmless here and the Palauan natives claim that all of these varieties can be cooked, together with their innerds intact, at any season without danger of poisoning. The ostraciids, tetraodontids, diodontids, and balistids are considered fairly good eating. The monacanthids and canthigasterids are used for food when nothing else is available.

#### Other poisonous fishes.

In the Palaus, the only other fish besides the puffer, considered to be poisonous are the "meas" and "klesebuul" from a limited locality on the east coast of Babelthuap near Geklou. These fishes are members of the family Siganidae (probably Siganus fuscescens and S. lineatus) and highly prized as food fish all over the Palaus except those in the Geklou locality where, according to the natives, the same species will cause nausea, vomiting, and effects similar to intoxication if merely the flesh is eaten, raw or cooked, at any time of the year. Specimens from this locality have not yet been collected by the writer but a trip is planned to obtain these fish for laboratory analysis and comparison with those of other localities. This widespread story among Palauan fishermen probably has some factual basis and would be an interesting case if these poisonous fishes are the same species

as the nonpoisonous fish from other areas. Although many fish have been reported to be poisonous in one part of the Pacific and nonpoisonous in another part, Japanese investigators have found that whenever the two forms have been compared they are morphologically distinct.

On Saipan, a large specimen of Gymnothorax flavimarginatus (the species reported to have poisoned some Filipinos recently) was collected and samples prepared for laboratory analysis. Apparently the same species is harmless in the Palaus but a comparison of the specimens from the two places may show they are not identical. A number of other poisonous species are being collected and studied, including some of the venomous scorpaenids.

Dr. H. Sommer of the Hooper Medical Foundation in San Francisco has generously offered to assay samples of poisonous fishes by a method worked out by him in which alcohol extracts of the toxin are injected into mice. A number of samples are being prepared for this purpose.

Respectfully submitted,

s/ Eugenie Clark

EUGENIE CLARK

August 15, 1949

Table 1. LIST OF PLECTOGNATH FISHES COLLECTED

June 24 to August 14, 1949

	<u>Kwajalein</u>	<u>Guam</u>	<u>Saipan</u>	<u>Palaus</u>
<u>BALISTIDAE</u>				
<u>Canthidermis</u> (new species?)				2*
<u>Balistes viridescens</u>				1
<u>Balistes chrysopterus</u>				12
<u>Balistes vidua</u>				11*
<u>Balistapus aculeatus</u>		10	8	18
<u>Balistapus rectangulus</u>			1	6
<u>Balistapus verrucosus</u>				6
<u>Melichthys radula</u>				2*
<u>MONACANTHIDAE</u>				
<u>Monacanthus tomentosus</u>				1
<u>Oxymonacanthus longirostris</u>			6	
<u>Amaneses scopas</u>				2*
<u>Ostraciidae</u>				
<u>Ostracion tuberculatus</u>				1
<u>Ostracion lentiginosus</u>			1	1
<u>Ostracion</u> (young specimen not yet identified)			1	
<u>Canthigasteridae</u>				
<u>Canthigaster margaritatus</u>	1	50+	50+	
<u>Canthigaster bennetti</u>			1	
<u>Canthigaster cinctus</u>				1
<u>Tetraodontidae</u>				
<u>Tetraodon meleagris</u>			1	
<u>Tetraodon immaculatus</u>		7	7	11
<u>Tetraodon mappa</u>				2
<u>Tetraodon hispidus</u>		1		6
<u>Tetraodon nigropunctatus</u>				3
<u>Tetraodon</u> (new species)?		1*		
<u>Diodontidae</u>				
<u>Diodon hystrix</u>		1		4

\* New record for the area.

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